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An Analysis of a Management Case: Green Hill Beach Development of the Rhode Island Coastal Zone

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UNIVERSITY OF RHODE ISLAND
Kingston, R.I.

AN ANALYSIS OF A MANAGEMENT CASE
GREEN HILL BEACH DEVELOPMENT OF
THE RHODE ISLAND COASTAL ZONE

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TABLE OF CONTENTS

CHAPTER		Page
INTRODUCTION		1
I	DESCRIPTION OF GREEN HILL BEACH	3
II	HISTORY OF GREEN HILL BEACH	5
III	THE ISSUES	10
IV	SYSTEMS ANALYSIS	14
V	ANALYSIS OF GREEN HILL BEACH	23
IV	CONCLUSIONS	38
NOTES		40
BIBLIOGRAPHY		43

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INTRODUCTION

One of the most valuable and misused assets possessed by the United States is the rich and highly varied coastal zone. The genesis of much of our material wealth and the basis for success of the early colonies has been our national fascination with the sea. As our industry and population have expanded the coastal zone, has been neglected seriously to the detriment of both current and future generations of Americans. Abuse of the coastal zone stems from employing it as a dumping ground, using the rivers flowing into it for effluent disposal and haphazard, poorly planned development. Since the coastal zone is a valuable asset which is threatened by conflicting use and poor management, an analysis of coastal zone management is a useful means of examining the problems of managing a vital resource.

Clearly, it is impossible to write a single paper which examines the entire coastal zone and assesses the entire spectrum of coastal management efforts. This paper, therefore, focuses on a single case study, Green Hill Beach in Rhode Island.

This paper will analyze Green Hill Beach development from a managerial stand point and will evaluate the performance of the government agencies concerned. To accomplish this it will be organized as follows:

- I. A description of Green Hill Beach
- II. A brief history of the area
- III. Issues
- IV. Systems Analysis
- V. Analysis of Green Hill Beach
- VI. Conclusions

I. DESCRIPTION OF GREEN HILL BEACH

Green Hill Beach is a barrier beach located in the town of South Kingstown, R.I. It extends from the Charlestown town line on the west to Lands Point on the east, a distance of 3 1/2 miles. It is located on the Atlantic Coast of Rhode Island approximately 12 miles west of point Judith, and faces Block Island.¹

The barrier beach is a sand bar, largely separated from the mainland, which is created by waves and wind. The sand was originally deposited by glacial action and over time waves have transported the sand to form a long, narrow bar and wind action has piled the sand up on the shoreward side of the bar to form a barrier dune. The dune is maintained by constant wind action and is stabilized by a growth of American Beach Grass (*Amphila Breviligulata* Fernald). The beach grass is extremely hardy and has adapted to the ^Rstenuous environment of the barrier dune. Unfortunately, the grass cannot withstand any degree of trampling. When trampled it dies and exposes the dune to "Blowouts" which can threaten the existence of the dune.²

Behind the dune ~~th~~is Green Hill Pond.³ This pond is tidal in nature and, as such, can be considered an estuary. It is a rich aquatic area which makes a substantial contribution to the Rhode Island fishing industry and provides a habitat for several species of migratory water fowl.⁴

Shoreward from the salt pond is the salt marsh. This area is composed of low lying soil covered with a growth of plants with varying degrees of adaptability to salt water. The marsh, as in the case of the pond, supports a variety of aquatic life and serves as a habitat for migratory water fowl.⁵ Shoreward from the salt marsh, the land slopes gently upward to the abrupt hills of the Charlestown Moraine.⁶

The entire system of beach, barrier dune, salt pond, salt marsh, and low lying coastal land forms a delicately balanced ecosystem which is unique to barrier beach complexes. The balance of plant and animal species existing in the salt ponds, marshes and lowlands depend upon the barrier beach for protection from incursions from the sea. The water level and salinity tolerances of life in the ponds and marshes is limited and requires a barrier beach for protection. Moreover, the lowlands behind the marsh would be flooded during storms were it not for the protection provided by the barrier beach. The barrier beach, in turn, is dependent on beach grass for soil stabilization. If the beach grass is damaged or removed, the barrier dune will erode excessively from wind and storms and the entire complex will be jeopardized.

II. HISTORY OF GREEN HILL BEACH

The earliest date in the history of Green Hill Beach which is germane to the paper is 1938. At that time the beach was fully developed with 250 houses situated along the shore line. A hurricane totally obliterated the beach, destroying all 250 houses and killing 38 people. In 1954 Hurricane Carol struck the beach and again totally destroyed the area with further loss of life.⁷

After Hurricane Carol, a beach danger zone was adopted by South Kingstown which placed severe restrictions on development in the Green Hill area. When the town zoning ordinance was revised in 1966, the danger zone was dropped. This action has never been explained satisfactorily, but it appears that the town planning board was advised that the intent of the 1954 beach danger zone legislation would be preserved through other regulations. Whatever the intent of the town planning board, loopholes developed which permitted developers and individuals to purchase lots on the Green Hill barrier beach and to acquire permits for construction.⁸

From 1966 until 1972, development on Green Hill Beach was minimal and no action was taken. In 1972, the South Kingstown Town Council became aware that construction was progressing rapidly and that action would have to be taken to preserve the beach. Moreover, since construction on the beach endangered the lowlands behind the salt marsh, the eligibility of property

owners under the national flood insurance program would be terminated, resulting in severe financial losses, as well as sharply increased danger of destruction from storms.⁹

Accordingly, on 7 August 1972, the South Kingstown Town Council met to consider adoption of an ammendment to the zoning ordinance and maps as recommended by the South Kingstown Planning Board. The ammendment proposed to establish a flood danger zone on Green Hill Beach which would effectively stop all development.¹⁰ On 16 August, following a series of hearings on the issue, the town council rejected the proposed ammendment by a 3-2 vote. They further decided to turn the problem over to the Rhode Island Coastal Resources Management Council (CRMC) for resolution, since there was some question in the minds of several councilmen regarding the jurisdiction of the town council over the Barrier Beach.¹¹

The Chairman of the CRMC initially stated that the CRMC did not have jurisdiction until such time as the town council acted. In the event that the local council approved development, the CRMC would then have to insure that the proposed construction was in conformance with state law. Subsequently, however, the CRMC decided that it did, indeed, have jurisdiction and announced its intention to issue "cease and desist" orders against the Green Hill property owners.¹² The property owners, anticipating the "cease and desist" order, countered by seeking a court injunction against the CRMC, which was denied in the Rhode Island Superior Court by Judge Christopher DelSesto.¹³

Following the court decision the CRMC sought an opinion from the Attorney General of Rhode Island, Richard J. Israel. The Attorney General replied, on 7 September 1972, that the CRMC did have jurisdiction over Barrier Beaches provided that certain conditions were met. The conditions alluded to by the Attorney General were that the CRMC was required, by law to a) file a detailed plan with the Secretary of State for Rhode Island; b) issue or deny permits for coastal development in accordance with the plan; c) advertise the existence of the plan and hold public hearings. The Attorney General further modified these conditions by stating that, in certain cases, the CRMC was empowered to adopt emergency programs for certain areas, temporarily bypassing the public hearing stage.¹⁴

Following the opinion by the Attorney General, the CRMC met on 19 September 1972 and voted to issue cease and desist orders to all property owners who had not commenced construction. A group of 8 property owners who had already commenced construction were not affected.¹⁵ Shortly after taking this action the council filed an emergency interim coastal resources management plan with the Secretary of State which is required by law prior to council action having legal effect on coastal development.¹⁶

The CRMC cease and desist orders were turned over to the Division of Enforcement of the Rhode Island Department of Natural Resources. The Division Head, Mr. Charles C. Bolwell, refused to process the orders and stated that CRMC is responsible

for enforcing its decisions, if it can. Since the CRMC consists of 17 unpaid, appointed officials with little or no staff support, it is unable to process legal warrants. The end result of the enforcement dilemma was that construction at Green Hill Beach actually accelerated following the 19 September decision of CRMC to issue cease and desist orders.¹⁷

During this same period, on 25 September, the South Kingstown Town Council adopted a 60 day moratorium on construction in the Green Hill Beach area.¹⁸

On 31 October 1972, the CRMC issued one cease and desist order to a property owner, Miss Nancy Fillmore. Miss Fillmore promptly went to court. A hearing was held on 12 December 1972 in the Superior Court. Judge Arthur A. Carrellas continued the case and permitted Miss Fillmore to continue construction at her own risk. If the construction is subsequently ruled illegal, she will be forced to raze it.¹⁹

In January 1973, the South Kingstown Town Council lifted its own building moratorium for Green Hill, following the continuance of Miss Fillmore's case and other zoning cases which indicated that the ban on building was probably illegal since it penalized property owners without compensation.²⁰

Also, in January 1973, the committee on Planning and Policy of the Coastal Resources Management Council convened a Citizens Advisory Committee to advise them on state policy as regards to Barrier Beaches. The Citizens Committee held four meetings. At its last meeting on 28 February 1973, the committee adopted

a report which contained a series of recommendations for consideration by the Planning and Policy Committee of the Coastal Resources Management Council.²¹

Since the apparent failure of legal sanctions against property owners at Green Hill, a number of attempts have been made to secure financial support which would permit condemnation of Green Hill followed by "fair market" compensation to the present owners. To date this effort has not been successful.²²

The current situation at Green Hill Beach is that development is continuing despite the issuance of cease and desist orders by Coastal Resources Management Council.

III. THE ISSUES

From the events which have transpired and the inconclusive action to date, it becomes clear that the problem is complex. A number of well meaning men have made an effort to accomplish a relatively simple task; to wit, save the Green Hill Barrier Beach from damage which is sure to be inflicted by development. All efforts to date have failed and as construction continues the problem will become increasingly severe. Moreover, the problem is frustrating since there are no villains. There are no scheming, profit hungry developers, not corrupt public officials who have profited from the situation, and no identifiable interest group seeking to affect the decision for nefarious purposes.

What does exist is a group of property owners on the one hand who are seeking to build summer houses on lots for which they have paid upwards of \$15,000. On the other hand are a group of concerned environmentalists and government officials seeking to prevent loss of a valuable natural resource.

From this picture it is possible to list the issues. The list below is not complete, but is adequate to illustrate the complexity of the problem.

The issues:

Rights of property owners to either retain use of land purchased in good faith or to receive compensation for denial of intended use.

Rights of property owners on low lands to retain eligibility for Federal Flood Plan Insurance.

Jurisdiction of South Kingstown Town Council.

Jurisdiction of Coastal Resources Management Council.

Constitutionality of Rhode Island Act creating a Coastal Resources Management Council and making an appropriation therefore.

Preservation of the Green Hill Beach complex, including salt ponds and tidal marshes.

Governmental obligation to insure, serve and otherwise protect Green Hill Beach property owners once building permits are granted and acted upon.

Access to the Green Hill Beach area for non-residents.

Rights of those who currently earn an income from salt pond and marsh resources.

Having listed the issues it is necessary to examine them to determine which would be resolved by a decision to permit development or to discontinue it and also to determine how the several interest groups concerned would be affected.

Those issues which would be settled by a decision permit construction or stop-it are:

Rights of property owners on Green Hill Beach.

Rights of property owners on lowlands behind the salt marshes. (possibly)

Governmental obligation towards the Green Hill Beach property owners.

The remainder of the issues will not be settled by the decision to stop or continue construction. The legal issues, the Beach access issue, and the preservation of Green Hill Beach will remain unresolved and require subsequent decisions by one government body or another.

Complexity of the Problem:

It appears then, that contrary to popular belief and the often expressed belief of many government officials concerned with Green Hill Beach, that it is not a simple question of whether to permit development or not. Rather, it is a complex problem which must be approached comprehensively if there is to be any hope to solution.

Rhode Island Efforts:

That such shortsightedness should have occurred in Rhode Island on an issue regarding the coastal zone is discouraging since Rhode Island, in contrast to most other coastal states, has available a comprehensive set of laws and institutions for managing and preserving the coastal zone.²³

In 1969 a Technical Committee appointed by the Governor, supported by The Statewide Comprehensive Transportation and Land Use Planning Program, the Department of Natural Resources, and the University of Rhode Island prepared the State of Rhode Island Report of the Governor's Committee on the Coastal Zone. The report was issued in March 1970. Contained in the report was a comprehensive survey of the coastal zone, its assets and the shortcomings of state and local law and managerial institutions

which threatened the coastal zone. Moreover, the report made a series of recommendations for correcting the deficiencies of coastal zone management, the most important of which was a recommendation to create a coastal zone council with broad powers of coastal zone regulation.

In the January session of the 1970 Rhode Island legislature a bill was introduced to implement the technical committee recommendation, but because of a conflict between broad scale resources management and the prerogatives of local government, action was forestalled and the bill failed. Following the defeat, the Governor strengthened the membership of the Technical Committee and charged it with the responsibility of drafting new legislation. This action was accomplished and during the 1971 session of the legislature a modified bill passed establishing the Coastal Resources Management Council with essentially the powers recommended by the Technical Committee.²⁴

It is evident that the state government of Rhode Island is not blind to the threat posed to the coastal zone by unplanned growth and has responded to the challenge with enlightened, progressive legislation. Nevertheless it also is evident that all the effort expended to save the coastal zone may not succeed in saving the last remaining unspoiled stretch of Barrier Beach in Rhode Island. What went wrong? In an attempt to find out what went wrong, this paper will examine the Green Hill Beach case from a systems analysis standpoint.

IV. SYSTEMS ANALYSIS

Prior to examining the Green Hill Beach case from a systems analysis standpoint, it is first necessary to acquaint the reader with the systems analysis approach.

Systems analysis is a systematic approach to helping a decision-maker choose a course of action by investigating (the) full problem, searching out objectives and alternatives, and comparing them in the light of their consequences, using an appropriate framework -- in so far as possible analytic - to bring expert judgement and intuition to bear on the problem.²⁵ Another way of looking at systems analysis is that it is more of a research strategy than a method or technique, and in the present state of development it is more of an art than a science, although scientific methods are utilized wherever possible. In sum, systems analysis may be viewed as an approach to, or a way of looking at, complex problems of choice, usually under conditions of uncertainty.²⁶

Having defined systems analysis we will now proceed to show how it functions. Since systems analysis is, in reality, nothing more than a framework for orderly thinking about problems, it provides a systematic approach to problem solving. The process of systems analysis is not laid out in a rigid structure, but is a guide which can be modified to suit the complexity and characteristics of the problem under consideration.

The Process of Systems Analysis Consists of:

Formulation (The Conceptual Phase)	Defining and clarifying objectives, defining issues of concern, limiting the problem.
Search (The Research Phase)	Looking for data and relationships as well as alternative programs of action that have some chance of solving the problem.
Evaluation (The Analytic Phase)	Predicting the consequences that are likely to follow from each alternative and then wrapping the alternatives in terms of these consequences.
Interperatation (The Judgemental Phase)	Using predictions and whatever other information or insight is relevant to compare the alternatives. Further, derive conclusions about them, and indicate a course of action.
Verification (The Scientific Phase)	Testing the conclusion by Experiment. ²⁷

The process of formulation can be largely restated as defining the objective and is critical to analysis. If the wrong objective is chosen or if the correct objective is recognized but ignored, the results can be tragic. If the wrong objective is chosen it means that the wrong problem is being solved. Another important aspect of formulation is limiting the problem of defining its full dimension. All too frequently the problem is defined too broadly and solution becomes impossible because all the consequences of any particular alternative cannot be predicted. The opposite pitfall is to define the problem too narrowly and to ignore alternatives or fail to recognize consequences of alternatives. In sum, formulation consists of defining the

objective and stating limits of the problem clearly. If this is not done at the outset, in terms which are clear to all concerned, confusion and failure will result.

The Search phase consists primarily of gathering information about the problem, becoming familiar with all its aspects and formulating alternatives. It is important to note that the search phase must be related to the formulation phase; that is, the alternatives chosen must relate to the objectives and the data which are gathered must conform to and test the dimension of the problem. The most common pitfalls during the search phase are to concentrate exclusively on gathering data and developing alternatives, which are not relevant to the objectives because they exceed the dimension of the problem or, alternatively, failing to gather sufficient data to deal with all relevant, if unstated, alternatives.

The evaluation phase is the most difficult and is clearly crucial to successful analysis. In the evaluation phase, alternatives must be evaluated to determine their consequences. In evaluating alternatives, the following must be accomplished:

1. Uncertainty must be dealt with explicitly. It is clearly impossible to have complete information on all aspects of all problems. As a consequence, successful analysis must deal with uncertainty by defining those areas which are unknown. By so doing, it is possible to deal successfully with problems which contain significant areas of uncertainty. Analytical

techniques such as a fortiori analysis, Monte Carlo techniques, Delphi Technique, and sensitivity analysis, which will not be explained in detail here, are extremely useful techniques for resolving uncertainty. Moreover, in those situations in which such techniques are inappropriate, analysis is enhanced by stating uncertainty explicitly and using assumptions to resolve uncertainty so that its probable effects can be dealt with in assessing alternatives. By addressing uncertainty explicitly it is possible to come up with a solution which is approximately right; by ignoring it is highly probable that the solution will be exactly wrong.

2. Build a framework using assumptions. The decision-making process cannot proceed in a vacuum but requires a logical framework which defines the state of nature and limits the scope of the problem. All decision-makers, whether they realize it or not, make assumptions. Unfortunately, the assumptions are frequently unwarranted or implicit. Unwarranted assumptions are clearly a major pitfall and are to be avoided at all costs. Implicit assumptions, however, are even more harmful to analysis than unwarranted assumptions since they tend to provide unexpected results when alternatives are put into action, frequently with dismaying consequences. It is absolutely necessary, therefore, to list all assumptions, including those which are intended to resolve uncertainty and to keep the assumptions in mind throughout the analytic process. By this technique assumptions which prove to be unwarranted or are resolved by analysis can be

formulated as the need arises, thereby preserving an orderly, logical framework throughout.

3. Cost must be addressed in meaningful terms. This means relating costs to alternatives and confronting the problem of opportunity costs. Merely recognizing that a solution will be expensive does not constitute addressing costs adequately. The most common pitfall in addressing costs is to attempt to achieve the best solution for the least cost. Such a goal is logically inconsistent, however, since the optimal solution is generally expensive and least cost is zero. Two acceptable means of dealing with costs are to establish a minimum acceptable solution, and use analysis to determine costs, or to adopt a fixed budget and employ analysis to achieve the best solution which can be supported within the predetermined budget. The latter cause is usually employed because in the real world costs are almost always a constraint.

Relating costs to alternatives is crucial to analysis since one of the most important consequences of any alternative is cost. Treatment of cost separately from alternatives leads to an inconclusive analysis because it fails to provide the decision-maker with the single most important consequence of any given alternative. This point may seem self-evident and unnecessary of exposition. Unfortunately, it is a common pitfall since most analysis fails to relate costs to alternatives but rather tend to ignore the problem of costs and, as a

consequence, fail to provide the decision-maker with adequate information regarding the consequences of proposed alternatives.

The problem of opportunity costs is always difficult to address. Opportunity cost means the benefit foregone by expending the proposed resources for purposes other than the problem under analysis. At its most complex, evaluation of opportunity costs means deciding to spend scarce resources on weapons systems or to alleviate poverty. Complex problems such as these are not amenable to systems analysis in its present form and judgements on pervasive problems of the "guns or butter" nature must, perforce, be made heuristically. Resource allocations of a less complex nature, however, are susceptible to treatment by analysis, albeit often with great difficulty. The essential step is to quantify the benefits and costs of alternatives in order to conduct cost/benefit comparison.

4. Measures of effectiveness must be devised. One of the most difficult aspects of decision-making is to relate alternatives and their consequences to the objectives. Systems analysis does this by using measures of effectiveness. This device provides a means of determining what any given course of action will accomplish towards achieving the objective.

For an example of how measures of effectiveness can affect decisions we turn to the Allied experience in the North Atlantic during World War II. At the outset of U.S. involvement in World War II, it became apparent that German submarines posed a serious threat to U.S. efforts to support our European

allies, particularly the British. At that time, the measure of effectiveness in combating the submarine threat should have been the success of resupply operations. Unfortunately the measures of effectiveness actually adopted was the number of German submarines sunk. The consequence of this inappropriate selection of measures of effectiveness was an intense anti-submarine campaign which included bombing missions against submarine pens, mining of passages, and intense hunter-killer operations conducted by air and surface units against German submarines. The results were disastrous. Very few submarines were sunk while the Allies incurred high losses in air crews, surface combatants, and merchant shipping. In 1942 the futility of the antisubmarine campaign was recognized and the appropriate measure of effectiveness, successful resupply, was substituted. The consequence of this decision was the convoy system which effectively defeated the German submarine threat by mid-summer 1943, thus permitting the massive reinforcement effort which led to the cross channel invasion and subsequent defeat of the Third Reich.

This illustration is provided to emphasize that inappropriate selection of measures of effectiveness can, and does, lead to disastrous decisions. Consequently, analysts and decision-makers must be extremely careful in insuring that measures of effectiveness are chosen with care and based on complete knowledge of the problem under consideration.

5. Criteria or a criterion must be devised. The final act in the evaluation phase is the development of a decision rule(s). Once all the other work has been done, the choice among alternatives will hinge on carefully devised decision rule. Again, as in the case of measures of effectiveness and costs the criteria must relate to the objective.

Frequently it is difficult to differentiate between measures of effectiveness and criteria. The important point in separating these [↑] vital decision-making tools is that measures of effectiveness provide a means of predicting the consequences of alternatives while criteria are used to choose among alternatives.

The Interpretation phase is, in a real sense, the phase at which formal analysis ends and judgement begins. During the interpretation phase the decision-maker takes the results of analysis and applies his own judgement. It is apparent, therefore, that, while we have shown criteria in the evaluation phase since analysts must, and do, develop criteria, that it is in the interpretation phase that criteria are employed to select among alternatives. Moreover, the decision-maker will frequently modify the criteria selected by the analyst to suit his conception of the state of nature within which he is making the decision.

The advantage of dividing the decision process in this way is that the analyst is free to produce a rigorous analysis based on available data and quantitative evaluation techniques,

unencumbered by considerations of policy, political feasibility, etc. The decision-maker adds these necessary considerations to the decision process after all the facts and relevant analytical considerations are exposed. In this way it is hoped that decisions will reflect an honest evaluation of all facts coupled with seasoned judgement of the state of nature. That this ideal is seldom achieved does not invalidate it, but indicates that more effort and rigor is required if good decisions are going to be forthcoming.

The verification phase is included since it is an important phase of analysis in situations which lead themselves to experimentation. Frequently, however, the verification phase will be accomplished indirectly if at all. In the case under consideration in this paper it will not be accomplished at all.

The exposition of systems analysis contained above is far from complete since volumes have been written on the subject. Readers who desire to learn more about systems analysis, quantitative management techniques, and operational research are encouraged to start with the basic texts listed in the bibliography.

Despite the rather superficial treatment accorded systems analysis, we have examined it sufficiently to proceed to an analysis of Green Hill Beach.

V. ANALYSIS OF GREEN HILL BEACH

Analysis will consist of examining Green Hill Beach from the standpoint of:

- A. The Need for Analysis
- B. Assumptions
- C. Uncertainty
- D. Objectives
- E. Alternatives
- F. Costs
- G. Measures of Effectiveness
- H. Criteria

A. The Need for Analysis:

From the inception of Green Hill Beach controversy to almost the present, the need for analysis was discounted. The South Kingstown Planning Board, in dropping the flood danger zone from the South Kingstown zoning ordinance in 1966 clearly did not believe that analysis was required. This decision, made in a most perfunctory manner, is the root cause of the Green Hill controversy. It must not be inferred from the above, however, that the South Kingstown is guilty of misfeasance. The fact is that in 1966 the hurricane danger had subsided, data on the ecological danger posed by development was not available, and pressures for shorefront development were substantial.²⁸ The South Kingstown Planning Council apparently acted in good faith but made a bad decision as a

result of poor information, a regretable lack of foresight, and failure to think rigorously about the implications of their decision.

The Coastal Resources Management Council, upon becoming involved in the Green Hill controversy reacted in a manner similar to that of the South Kingstown Planning Board. The council approached the problem on the basis that a decision to save the beach was all that was required with apparently little or no appreciation for the fact that the issue was extremely complex. In fact, on about 21 September 1972, shortly after the CRMC had issued the now defunct cease and desist orders against the Green Hill property owners, Dr. Vincent J. Oddo, then the Council Chairman, stated that if the town (of South Kingstown) passes the flood zone ammendment, the CRMC would not be required to take any further action because the beach cannot be further damaged if no construction is permitted.²⁹ For a high state official, this statement reveals an appalling lack of appreciation for a situation in which that official plans to take decisive action. All of this, despite the fact that the law establishing the CRMC, it will be recalled, required the council to file a master plan prior to proceeding willy-nilly to pass out cease and desist orders, etc.

To the credit of the CRMC, however, once it was pointed out to them that the law required comprehensive planning, they sought assistance. The Coastal Resources Center of University of Rhode Island has published a two volume report

entitled, Rhode Island Barrier Beaches, which promises to provide valuable assistance in barrier beach management, despite some shortcomings which will be discussed below under 'cost.'

While much more could be written regarding the need for analysis in the issue of Green Hill Beach Development, the two examples cited above are sufficient to show that, in general, the agencies and individuals concerned revealed a distressing lack of appreciation for the dimension of the problem they were confronting and the need for a rigorous, disciplined approach based on thorough knowledge and an understanding of the issues involved.

B. Assumptions:

Some of the assumptions relevant to Green Hill Beach development, as they were employed by the agencies concerned, were:

1. The South Kingstown Planning Board in 1966:

That the flood danger zone on Green Hill Beach would be preserved by laws other than the town zoning ordinance or less charitably, that the flood danger zone was not as important as the tax revenues which would be generated by Green Hill Development.

2. The South Kingstown Town Council in 1972:

That they lacked the legal and financial means to overturn an apparent "mistake" committed in 1966 by the South Kingstown Planning Board.

3. The Rhode Island State Legislature and Administration in 1971:

That creation of a coastal agency with broad powers over coastal matters would somehow fill in all the gaps created by shortcomings of existing laws, both state and local, with no jurisdictional disputes or unseemly resistance by those whose interests were directly affected.

4. The Coastal Resources Management Council in 1972:

That a simplistic reading of the law which created it, coupled with a carefully hedged opinion from the State's Attorney General, provided the council with the legal and financial resources to resolve the Green Hill Beach controversy.

That the Green Hill controversy was a simple matter which could be resolved easily.

The list of assumptions shown is far from complete but serves to show that at each decision point, each agency concerned made assumptions, whether they realized it or not. Moreover, with the exception of the South Kingstown Town Council, they invariably made an incorrect assumption. The end result of making incorrect, or unwarranted, assumptions led, as we have seen, to an administrative and legal quagmire from which no escape is yet in sight. The foregoing points out rather graphically the absolute need to approach decision situations

with care and to create a realistic framework for decision-making based on carefully drawn assumptions which reflect the state of nature and are relevant to the decision situation.

C. Uncertainty:

As is the case with distressingly high number of decisions, those made in regard to Green Hill Beach ignored uncertainty. Each decision maker and agency acted as if he, or they, had a adequate information available on which to base decisions. The fact is that they sadly lacked information but persisted in making decisions anyway.

By treating uncertainty explicitly, by taking a careful inventory of those things which were known and those things which were unknown, and making judicious allowance for the many unknowns, much grief could have been avoided.

In examining the Green Hill Beach controversy it becomes evident that two areas of uncertainty are dominant. These are the legal rights of the parties affected and the cost of implementing decisions. Since the decision-making agencies concerned did not make an effort to determine the legal rights of property owners on Green Hill Beach or of those on the mainland whose property values would be affected by beach development, they were unable to develop realistic alternatives which could be treated analytically. It further appears that all decision-makers were aware that some significant costs would be involved in any decision. Through

carelessness or design, however, they chose to ignore the question of costs, thereby adding to uncertainty.

It can be concluded, therefore, that ignoring uncertainty can easily lead to seeming worthwhile solutions which prove unworkable in the real world in which uncertainty abounds. By assessing uncertainty explicitly, decision-makers concerned with the Green Hill Beach controversy might have been able to develop workable solutions. By ignoring it they assured themselves of developing unworkable solutions.

D. Objectives:

In the Green Hill Beach controversy there is a clear objective. Namely, preserve the delicate ecosystem of Barrier Beach, salt pond and marsh for our own and future generations.

There can be no question that the objective is worthy of attainment. Unfortunately, in considering the problem, the ultimate objective was often overlooked and a possible measure of effectiveness, bringing building activity to a halt, was substituted. It might appear that this is a minor mental lapse which would have little or no effect on subsequent actions. This, however, is not the case. By overlooking the objective, the decision-makers put themselves in the position of believing that a decision relating to beach construction would solve the problem. In fact such a decision relates to only part of the problem.

The need to state an objective clearly at the outset of tackling a difficult problem is clear and, for the most part,

was accomplished well by the parties involved in Green Hill. It also necessary, however, to keep the objective in mind at all stages of the decision-making process. Unfortunately, there were a number of instances in which the objectives was overlooked. The result was concentration on beach construction rather than on the whole problem. As can be expected, the tendency to overlook the previously stated objected led to poor decisions.

E. Alternatives:

In virtually all the discussions leading to the decisions regarding Green Hill Beach, it appears that only two alternatives were ever considered seriously. There were: 1) stop beach construction, and 2) permit beach construction to continue. By limiting themselves to only two alternatives, the decision-makers virtually assured failure. It is true that a number of those involved did consider other alternatives but they were never given serious public consideration.³⁰ If, at the outset, the South Kingstown Town Council or the Coastal Resources Management Council, when they entered the controversy, had listed all possible alternatives and examined each critically, it is quite possible that a viable solution could have been achieved. While the following list is not complete, it does serve to illustrate the range of alternatives available, in contrast to the narrow two alternative context in which the problem has been addressed to date. The alternatives are

sub-optimized into two categories: those which address the short term problem of controlling beach development and those which address the long range problem of regulating use of the Green Hill Beach, pond, marsh complex.

1. Alternatives to deal with beach development.

(a) Moratorium on all future construction by revocation of current building permits and denial of future permits.

(b) Condemnation of beach property coupled with immediate compensation to owners.

(c) Rezoning to reduce congestion. (partial solution which would permit some construction and would have no effect on those permits already granted)

(d) Temporary moratorium negotiated with property owners to provide time in which to seek funds and write a comprehensive beach development plan.

(e) Permit uncontrolled construction.

2. Alternatives which address ultimate preservation of Green Hill Beach complex.³¹

(a) Strict conservation.

(b) Limited Public Development

(c) Limited Private Development

(d) Mixed Public/Private Development

(e) Uncontrolled Development

Achieving the objective of preserving the Green Hill Beach complex will require selection of one alternative from each

sub-optimization. By sub-optimizing alternatives, the priorities become clear. Acquisition of the beach property is a near term necessity which must be followed by a comprehensive program for preservation.

Clearly, listing all possible alternatives, considering their efficacy and then developing a plan for prosecution of selected alternatives yields a rational approach to attainment of the objective. To date this has not been done adequately by any agency concerned.

F. Costs

The most difficult aspect of analysis is cost. Of all the analyses conducted every year, very few are really useful to the decision-maker because they fail to address costs adequately. The work of those who have tried to grapple with the Green Hill Beach controversy has not improved on this dismal record.

A few examples will serve to illustrate this important point.

1. The South Kingstown Town Council could not agree to enforce a building ban on the beach because it lacked the resources to condemn beach property and compensate the owners at a fair market value.³²

2. The Coastal Resources Management Council could not enforce cease and desist orders which deprived property owners of use of their land with no compensation.³³

3. The URI Community Planning Study lists long range, but not short range, alternatives, but does not relate ~~to~~ the alternative to costs. Moreover, the attempt in this study to treat costs is not very useful since it consists primarily of discussing possible sources of funds without making any explicit recommendations on the cost of each alternative or on specific means of securing the required funds.³⁴

4. The Coastal Resources Center report on Rhode Island Barrier Beaches which is devoted in part to Green Hill lists recommendations for the future of Green Hill Beach but does not relate these recommendation to costs.³⁵

From the above it can be seen that none of the agencies which have tried to solve the Green Hill Beach development problem have come to grips with costs. That this is so is regrettable since prior experience indicates that failure to deal with costs generally equates with failure to achieve a solution to the problem.

Because of the pervasive failure to deal with costs in any meaningful way, it will be profitable to explore the reasons for this failure and discuss some means by which the decision-makers and analysts concerned with the Green Hill Beach problem might deal with this thorny problem.

In analysis generally the analyst is confronted with one of two constraints. These are: 1) to achieve some minimum

capability regardless of cost, and 2) to achieve an improvement of capability within a predetermined budget. In the case of constraint, 1- the analysis deals with cost only to the degree that he seeks the lowest cost alternative to achievement of the minimum capability. In the case of constraint, 2) he seeks the alternative which provides the greatest capability within the predetermined budget. An example of constraint 1, is the Apollo program in which every effort was made to hold costs down but not to a degree which would interfere with a manned lunar landing within a ten year program cycle. An example of constraint 2, is a weapons development program with a fixed budget. While it must be noted that such programs often exceed budget limitations, the cost "overruns" are considered to be failure of analysis.

Upon close examination it becomes clear that Green Hill Beach falls into category 1. That is, a minimum solution, namely preservation of the beach, is required. The problem is that no funds have been identified with which to defray the costs of meeting such a requirement. The analysts and decision-makers, who are fully aware of the complete lack of funds, have therefore chosen to skirt the issue of costs by dealing with it peripherally by discussing possible sources

of funds or by proposing legal action which might solve the problem without compensation to the owners, thereby solving the problem at zero cost. To date these approaches have not succeeded in solving the problem and it is unrealistic to expect that they will in the future.

In the opinion of this author, the only possible way of dealing with cost is to do so in as forthright a manner as possible. Near-term and long-term alternatives must be developed and costed. Since no budget has been allocated, cost should be dealt with as shown for category 1, with alternatives favored which offer a solution which achieves the objectives of beach preservation at the lowest possible cost. Once such a compilation has been made the decision-maker will have available a set of alternatives and their consequences, including costs. Any other approach serves to obfuscate the issue and delays resolution of the issue since the problem of cost will ultimately have to be dealt with.

If it should happen that the costs exceed available resources then it may be that the beach cannot be preserved at all or a budget approach will have to be adopted which will allow some measure of beach preservation as permitted by available resources. At the very least, however, explicit, straight forward treatment of costs will provide the decision-maker with a clear picture of the resources required to solve the problem. Without this information it is impossible to even begin the task of acquiring the resources necessary to attack the problem.

An additional step which might be considered is to address the problem of opportunity costs. Green Hill Beach represents a valuable asset which is in danger of destruction. There are a number of quantifiable benefits to derived from preservation of the beach complex, both in the near and long terms. Moreover, preservation of the beach provides unquantifiable, but nevertheless real, benefits which can not be ignored. By listing all the benefits which will accrue from beach preservation, it should be possible to conduct a cost benefit analysis of Green Hill Beach preservation. It should then be possible to demonstrate that resources currently allocated to other uses should be diverted to Green Hill since the use for which they are currently intended will not produce the benefits that preservation of Green Hill will produce.

Subsequent to a forthright treatment of costs, as they relate to alternatives, and a cost benefit analysis of Green Hill Beach preservation, the cost aspects of the problem will be available. It is to be hoped that these steps will result in acquiring the resources necessary to achieve the objective of beach preservation. If these efforts fail, then it must be concluded, regretfully, that the objective is unattainable. By continuing to ignore costs, however, all that is accomplished is a delay in dealing with the crux of the issue and preservation for the illusion that Green Hill Beach can be saved.

G. Measure of Effectiveness:

One of the most obvious aspects of the Green Hill Beach controversy is that, for the most part, the decision-makers do not appear to have been aware of the long range implications of any particular decision. By losing sight of the objective and neglecting to list alternatives, decision-makers were precluded from developing measures of effectiveness. This is all the more regrettable since useful measures of effectiveness were obvious.

By sub-optimizing near and long term alternatives, the contribution of any given alternative could have been related to the objective rather easily.

The obvious MOE for near term alternatives is the degree to which the alternatives preserved the barrier dune, which is the key to preservation of the entire complex. Moreover, it is within the state of the art to determine the amount of abuse which the dune and grass can withstand. Armed with this knowledge and using dune preservation as a sub-optimization, near term alternatives can be evaluated for their effectiveness.

The long range sub-optimization is more complex. The URI Planning and Development Study, however, suggests that it is possible to develop MOE for long range alternatives. These include: 1) long range economic gain, 2) controlled public access, 3) impact on surrounding inland areas. While these MOE are the result of a cursory examination, they serve to illustrate that useful MOE can be developed to evaluate long range alternatives.³⁶

H. Criteria:

In the case of Green Hill it is possible to establish a set of criteria based on the sub-optimization of the MOE into near term and long range evaluations.

Once all alternatives have been sub-optimized and evaluated, the following criteria for selection of alternatives can be employed:

1. Legality: It is the action called for legal?
2. Achieve objectives: Does it contribute to preservation of the Beach complex?
3. Economic Impact: Does the alternative incur costs, and if so, are the benefits commensurate with the costs.

By employing the criteria shown above it should be possible to select an alternative from each sub-optimization, to arrive at an optimal solution to the Green Hill Beach controversy.

VI. CONCLUSIONS

The Army frequently employs a concept called KISS to problem solving. KISS is an acronym for KeeP It Simple, Stupid. Certainly KISS is a useful concept and should be applied whenever possible to avoid unnecessarily complex solution to essentially simple problems.

By applying the systems approach to Green Hill Beach we seem to have violated KISS by taking what appears to be a simple decision situation regarding recreational housing on a 3 1/2 mile beach front and making it quite complex. On closer examination, however, it become apparent that in many decision situations, glossing over the complexity of the problem inevitably leads to a violation of KISS.

By failing to consider the full dimension of the Green Hill problem the South Kingstown Town Council and CRMC have taken what could have been a relatively straight forward problem and complicated it by failing to consider the full problem. As a consequence, delays in resolution, delays in commencing work on remedial measures, and unseemly court fights and jurisdictional disputes have been incurred. A realistic, rigorous, disciplined approach to the problem would have revealed at the outset that the problem was indeed costly and contained a number of thorny issues which would have to be resolved.

The procedure which has been followed, of making ill-considered decisions and avoiding the problem of cost, if continued, will lead to ineffective action which is in itself a form of decision since the inevitable march of events will decide the fate of Green Hill in the absence of effective action. It is to be hoped that all concerned will come to grips soon with the full dimension of the problem so that they can arrive at solutions based on selection of realistic alternatives.

It is clear from the investigation of the Green Hill Beach controversy that a systems analysis approach, if adopted from the outset, would have provided a way to keep it simple and at the same time to deal with the problem. It is also clear that in the absence of a framework such as system analysis, the problem will almost certainly continue to defy the best efforts of well intentioned and intelligent men~~x~~ to reach a workable, productive solution.

NOTES

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³"Barrier Beach." Providence Evening Bulletin.

⁴Planning and Area Development. p. 6

⁵Ibid., p. 6, 2

⁶Ibid., p. 7-9

⁷"Beach Development Deplored" The Providence Journal
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⁸"Shore Zoning Action Delayed" The Providence Evening Bulletin, 16 August 1972

⁹Interview with Mr. Walter Gray, Member of South Kingstown Town Council. 16 March 1973

¹⁰"Flood Zone Session is August 7" The Narragansett Times
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¹¹"State Council Plans to Halt All Building" The Providence Journal. 22 August 1972

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¹³"Court Refuses Order to Halt Coastal Unit" The Providence Evening Bulletin, 30 August 1972

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30Planning and Area Dev. p. 37

31Ibid., p. 40

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34Planning and Area Development. p. 45-47.

³⁵S.B. Olsen and M.J. Grant, Rhode Island Barrier Beaches:
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